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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

ED 066458

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

CAFE FINISHER (bake. Prod.) 6-02.97

B-576 S-246

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EDUCATION & WELFARE
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TM 001 942

U. S. Employment Service
in Cooperation with
Pennsylvania State Employment Service

March 1964

TECHNICAL REPORT

I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Cake Finisher 6-02.97.

II. Sample

During the period September 23-October 8, 1963, the General Aptitude Test Battery, B-1002B, was administered to a sample of 59 women employed as Cake Finisher 6-02.97 at Stroehmann Brothers Baking Company, Williamsport, Pennsylvania. Two workers were eliminated from the final sample: one because of lack of experience and the other because her job duties were different than those performed by the other workers in the sample. Therefore, the final sample consists of 57 female employees.

No formal hiring procedures are used by the company. Applications are taken at the gate and applicants are selected for employment on the basis of an interview.

The minimum training period for inexperienced Cake Finishers is five months. Experienced workers receive only two days of training. All workers in the final sample are considered experienced.

TABLE I

Means (M), Standard Deviations (σ), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience

N = 57	M	σ	Range	r
Age (years)	33.9	10.8	18-57	-.130
Education (years)	10.5	1.7	6-13	.450**
Experience (months)#	61.9	84.2	1-396	-.044

**Significant at the .01 level
#Experience at Stroehmann Brothers

III. Job Description

Job Title: Cake Finisher (bake. prod.) 6-02.97

Job Summary: Slices, ices, wraps, labels, inspects and boxes cakes, cookies and donuts by working at one of the stations on a production line which varies in number of workers and in the operations performed as the kind of product changes.

Work Performed: Loads trays by picking up cup cakes as they have fallen when dumped from baking pans Pan Dumper and places in trays in rows or directly on belt for feeding under filling machine. Aligns cup cakes again after they have been wheeled on racks to icing machine, taking care to have rows straight and in line with guide and with tops relatively level so that icing will cover tops evenly and decoration will be centered as cakes pass under outlets. Discards broken cakes by throwing in can.

Lifts pans from belt and loads on racks for wheeling to wrapping location and to allow time to elapse for icing to set if freshly iced. Picks up halves of round cakes after they have been cut in two by band saw and deftly turns one half with wrist motion so both halves are placed on table ready for Cake-Wrapping-Machine-Operator to load into machine. Picks up halves of cakes sliced horizontally, turns upper half over and lays both on conveyor for icing and folding as turnovers. Lifts wrapped cakes, cookies and donuts from conveyor or wrapping machine and places in trays or boxes, then places on conveyor to shipping department.

Spreads icing dropped by machine and deftly sweeps around top surface of round cakes as they pass by on conveyor. Folds turnover and feeds to wrapping machine. May scoop icing from bowl when icing layer cakes.

Operates boxing or wrapping machine. Starts machine by pressing switch and lays one cake or package of cookies on board in each space of wrapping machine, taking care to watch for no board, double labels, no labels, or inadequate sealing and stops machine for adjustment or allows forelady to adjust it. Picks out boards if supply of cakes momentarily fails. Calls to Band-Saw Operator for faster hand feed if necessary and calls to one of others on team if supply of paperboard is running low and hopper must be refilled. Boxes and wraps donuts by pushing them into open ends of boxes as they pass by on conveyor from right to left, skillfully pushing oblong "dunkers" from belt to table and into opening while turning them so they are gently entered in open end of moving box. Stops machine at end of run, or for adjustment, by pressing switch.

Sets up and stamps prices on folding boxes by rubber stamping price and pushing ends upward and, in some cases, hooking flaps, performing this operation as time permits between arrivals or readiness for wrapping of cakes.

Feeds cakes into rolls of Band Saw, which may be either horizontal or vertical, taking care to turn two-color cakes so cut will show both colors. Calls forelady if moistening solution runs too fast.

Packs cakes and packages of cookies in standard pattern and number in cartons for shipping by truck and delivery to food stores, placing them carefully to avoid damage. Seals boxes with tape from machine.

Inspects cakes, cookies and donuts. Looks for cracks in cakes due to breakage or to bursting from too much filling, for dark crumbs which detract from appearance, for uneven icing, for under or over size, and feels donuts for raumess. Throws rejects in bag or bin, accomplishing the inspection function at all tasks since inspection is continuous throughout the process. Throws soiled, bent, or otherwise unusuable boxes and wrapping into drum for disposal.

Hand-cuts cookies by pulling rack into position for loading, taking three cooky sheets from rack and placing on table beside board, places one sheet of paper on cooky sheet, rolls dough into ball after scooping additional dough from dough bowl with board so that ball will be large enough to nearly cover pastry board after it is rolled out. Spreads dusting flour on board to keep dough from sticking and rolls dough quickly and evenly over pastry canvas so that the thickness is uniform.

Cuts cookies with cutter in preferred hand and lays on other hand by releasing fingers over cutter air holes, while joggling arm and hand so cookies move up arm until up to two dozen cookies have been cut, while skillfully aiming with other hand so each cooky is cut adjacent to the previous one, leaving a minimum of dough for rerolling. Tosses soft cookies on cooky sheet in standard pattern, leaving enough room so they will not touch when baking. Feels dough for thickness and weighs a cooky occasionally to maintain standard size. Rerolls any cooky that is too thick and cuts again to remove excess.

Ices ends of machine-iced bar cakes by scooping icing from bowl with spatula and filling left hand with icing, then scooping enough icing for one cake from supply in hand and spreading over one end of cake while pushing it aside to expose both ends, so other end may be iced by girl on other side of table. Hand ices round layer cakes by brushing crumbs from surface with hands and laying layer on plywood disc covered with paper doilies if the cake is very large. Stirs icing periodically with spatula to avoid setting of surface icing. Places plastic ornament on top of wedding cakes. Spreads icing evenly over top and side of layers, taking care to cover all of the cake. Pushes skewers into upper layers before icing to provide rigidity. May mix colors with icing by hand, judging amount of color to use for the shade requested on the cake order. Decorates fancy cakes by making paper cone in hands and dropping metal tip into cone, then taking icing from bowl and filling base of cone. Rolls cone so no air is enclosed and cuts off paper tip with scissors. Squeezes cone and moves tip with deft arm motion to make flowers and other ornamental forms.

Cleans work area and machines.

GATB # 2489

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

CAKE FINISHER (bake prod.) 6-02.97

B-576

Summary

The General Aptitude Test Battery, B-1002B was administered to a final sample of 57 women employed as Cake Finisher 6-02.97 by Stroehmann Brothers in Williamsport, Pennsylvania. The criterion consisted of supervisory ratings. On the basis of mean scores, standard deviations, correlations with the criterion, job analysis data and their combined selective efficiency, Aptitudes G-General Intelligence, P-Form Perception, and K-Motor Coordination were selected for inclusion in the final test norms.

GATB Norms for Cake Finisher 6-02.97, B-576

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
G	CB-1- H CB-1- I CB-1- J	85	G	Part 3 Part 4 Part 6	80
P	CB-1- A CB-1- L	80	P	Part 5 Part 7	80
T	CB-1- G CB-1- K	100	K	Part 8	100

Effectiveness of Norms

The data in Table IV indicate that only 67 percent of the non-test-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 94 percent would have been good workers. 33 percent of the non-test-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms, only 6 percent would have been poor workers.

IV. Experimental Battery

All the tests of the GATB, B-100 2B, were administered to the sample group.

V. Criterion

The criterion consisted of two sets of independent ratings made by the foreman of the finishing department on USES SP-21, "Descriptive Rating Scale." A period of three weeks elapsed between the first and second ratings. The rating scale consisted of nine items covering different aspects of job performance, with five alternatives for each item. A reliability coefficient of .96 was obtained for the criterion. Therefore, the two sets of ratings were combined, resulting in a distribution of final criterion scores of 34 through 89 with a mean of 60.6 and a standard deviation of 13.3.

The above criterion data were collected on October 9 and 10, 1963.

VI Qualitative and Quantitative Analyses

A. Qualitative Analysis

On the basis of the job analysis data, the following aptitudes were rated "important" for success in this occupation:

Form Perception (P) - required to align cakes on racks before they are iced, and to inspect cakes for cracks, proper size and evenness of icing.

Motor Coordination (K) - required for rapid and accurate loading of cakes in wrapping and boxing machines.

Finger Dexterity (F) - required to fold paper around cup cakes, pick crumbs off cakes and fasten cartons in set-up position.

Manual Dexterity (M) - required to take cakes from racks and feed into band saw; to roll dough, spread icing, handle trays and cookie sheets.

On the basis of the job analysis data, V-Verbal Aptitude, N-Numerical Aptitude were rated "irrelevant" for success in this occupation.

B. Quantitative Analysis:

TABLE II

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N = 57

Aptitudes	M	σ	r
G-Intelligence	92.4	18.5	.560**
V-Verbal Aptitude	95.1	14.9	.415**
N-Numerical Aptitude	92.7	20.3	.587**
S-Spatial Aptitude	94.1	19.5	.311*
P-Form Perception	100.6	24.1	.424**
Q-Clerical Perception	104.0	18.3	.469**
K-Motor Coordination	112.1	14.4	.445**
F-Finger Dexterity	103.8	17.0	.233
M-Manual Dexterity	116.5	21.2	.300*

*Significant at the .05 level
**Significant at the .01 level

C. Selection of Test Norms:

TABLE III

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important					X		X	X	X
Irrelevant		X	X						
Relatively High Mean						X	X	X	X
Relatively Low Sigma		X					X		
Significant Correlation with Criterion	X	X	X	X	X	X	X		X
Aptitudes to be Considered for Trial Norms	G			S	P	Q	K	F	M

Trail norms consisting of various combinations of Aptitudes G, S, P, Q, K, F and M with appropriate cutting scores were evaluated against the criterion by means of the Phi Coefficient technique. A comparison of the results showed that B-1002 norms consisting of G-80, P-80 and K-100 had the best selective efficiency.

VII. Validity of Norms (Concurrent)

The validity of the norms was determined by computing a Phi Coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing 33 percent of the sample in the low criterion group because this percent was considered to be the unsatisfactory or marginal workers.

Table IV shows the relationship between test norms consisting of Aptitudes G, P and K with critical scores of 80, 80 and 100, respectively, and the dichotomized criterion for Cake Finisher 6-02.97. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV

Validity of Test Norms for Cake Finisher 6-02.97
(G-80, P-80, K-100)

N = 57	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	5	33	38
Poor Workers	17	2	19
Total	22	35	57

Phi Coefficient = .74
χ^2 = 31.122
P/2 < .0005

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes G, P and K with minimum scores of 80, 80 and 100, respectively, have been established as B-1002 norms for Cake Finisher 6-02.97. The equivalent B-1001 norms consist of G-85, P-80 and T-100.

IX. Determination of Occupational Aptitude Pattern

The data for this study did not meet the requirements for incorporating the occupation studied into any of the 35 OAP's included in Section II of the Guide to the Use of the General Aptitude Test Battery, January 1962. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.